



World's largest gold crystal studied at Los Alamos

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When geologist John Rakovan needed better tools to investigate whether a dazzling 217.78-gram piece of gold was in fact the world's largest single-crystal specimen — a distinguishing factor that would not only drastically increase its market value but also provide a unique research opportunity — he traveled to Los Alamos National Laboratory's Lujan Neutron Scattering Center to peer deep inside the mineral using neutron diffractometry. Neutrons, different from other probes such as X-rays and electrons, are able to penetrate many centimeters deep into most materials. "The structure or atomic arrangement of gold crystals of this size has never been studied before, and we have a unique opportunity to do so," the Miami University professor said. Revealing the inner structure of a crystal without destroying the sample — imperative, as this one is worth an estimated \$1.5 million — would allow Rakovan and Lujan Center collaborators Sven Vogel and Heinz Nakotte to prove that this exquisite nugget, which seemed almost too perfect and too big to be real, was a single crystal and hence a creation of nature. Its owner, who lives in the United States, provided the samples to

Rakovan to assess the crystallinity of four specimens, all of which had been found decades ago in Venezuela.

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